WHAT IS CLAIMED IS:

1. A method for active noise cancellation using independent component analysis which is characterized by adaptation of a filter to get components among signal components of the primary input which are independent of noise components which form the secondary input at the output end in active noise cancellation system, wherein the mixture of signal and noise that forms the primary input and noise that forms the secondary input.

2. The method for active noise cancellation using independent component analysis according to claim 1, wherein signal cancellation range corresponding to active noise is extended for the system which acquires many noise signals or mixtures of signal and noise by increasing the number of inputs or outputs of the said active noise cancellation system.

3. The method for active noise cancellation using independent component analysis which is characterized by canceling active noise by including the following steps or an arbitrary step;

in a cancellation method of active noise

cancellation system with a feedback structure,

(a) wherein zero delay coefficient, $w_{ii}(0)$, scales the data to maximize the information transmitted through the nonlinear function,

(b) wherein delay coefficient, $w_{ii}(k)$, $k \neq 0$, whitens each output from the corresponding input signal temporally, and

(c) wherein coefficient in a feedback cross filter, $w_{ij}(k)$, $i \neq j$, decorrelates each output

$$\varphi(u_i(t)) = -\frac{\frac{\partial P(u_i(t))}{\partial u_i(t)}}{P(u_i(t))}$$

from all other recovered signal $u_j(t)$,

where the said $P(u_i(t))$ approximates the probability density function of estimated source signal $u_i(t)$.

4. The method for active noise cancellation using independent component analysis according to claim 3, wherein signal cancellation range corresponding to active noise is extended for the system which acquires many noise signals or mixtures of signal and noise by increasing the number of inputs or outputs of the said active noise cancellation system.

5. The method for active noise cancellation using

independent component analysis which is characterized by controlling active noise by learning each adaptive filter coefficient according to the following expression in active noise cancellation system, wherein the mixture x_1 of signal and noise that forms the primary input and noise x_2 that forms the secondary input.

[Expression 11]

$$\Delta w_{ii}(0) \propto 1/w_{ii}(0) - \varphi(u_i(t))x_i(t),$$
$$\Delta w_{ii}(k) \propto -\varphi(u_i(t))x_i(t-k),$$
$$\Delta w_{ij}(k) \propto -\varphi(u_i(t))u_j(t-k). \quad \varphi(u_i(t)) = -\frac{\frac{\partial P(u_i(t))}{\partial u_i(t)}}{P(u_i(t))}$$

herein, the said $w_{ii}(0)$ is a zero delay coefficient in a direct filter, $w_{ii}(k)$, $k \neq 0$ is a delay coefficient in a direct filter, $w_{ij}(k)$, $i \neq j$ is a coefficient in a feedback cross filter, Δ before of each coefficient is change amount of the corresponding coefficient, t is sample index, and $P(u_i(t))$ approximates the probability density function of estimated source signal $u_i(t)$.

6. The method for active noise cancellation using independent component analysis according to claim 5, which is characterized by obtaining the said $u_i(t)$ by following expression.

[Expression 12]

$$u_1(t) = \sum_{k=0}^{K} w_{11}(k) x_1(t-k) + \sum_{k=1}^{K} w_{12}(k) u_2(t-k),$$
$$u_2(t) = \sum_{k=0}^{K} w_{22}(k) x_2(t-k)$$

7. The method for active noise cancellation using independent component analysis according to claim 5, wherein signal cancellation range corresponding to active noise is extended for the system which acquires many noise signals or mixtures of signal and noise by increasing the number of inputs or outputs of the said active noise cancellation system.